

Before the  
Federal Communications Commission  
Washington, D.C. 205554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

In the Matter of

Revision of the Commission's Rules  
to ensure compatibility with  
enhanced 911 emergency calling systems

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) CC Docket No. 94-102  
)  
) RM-8143  
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To: The Commission

**Comments of The Ericsson Corporation**

The Ericsson Corporation, on behalf of itself and affiliated companies (hereinafter collectively referred to as "Ericsson"), hereby submits its comments in response to the *Notice of Proposed Rule Making*<sup>1</sup> in the above-captioned proceeding. In support thereof, Ericsson states as follows:

Ericsson is a manufacturer of telecommunications systems and equipment, including voice and data mobile systems for Commercial Mobile Radio Service<sup>2</sup> ("CMRS") and Private Mobile Radio Service<sup>3</sup> ("PMRS") providers. Ericsson also

<sup>1</sup> *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, RM-8143, FCC 94-237, \_\_\_ Rcd \_\_\_ (released October 19, 1994) (hereinafter "NPRM").

<sup>2</sup> CMRS systems include, but are not limited to, cellular, PCS, trunked SMR and mobile data systems.

<sup>3</sup> PMRS systems include, but are not limited to, conventional SMR, public safety and other radio systems governed by Part 90 of the Commission's rules.

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manufactures network equipment and PBX equipment, including wireless PBXs. As such, Ericsson is well qualified to comment in this proceeding.

## **I. Introduction**

Ericsson supports the premise that mobile system users should be able to take full advantage of 911 services inasmuch as such services have the ability to save lives, property and in many other ways serve the public interest. However, as a manufacturer of numerous mobile systems and products Ericsson is aware that implementation of 911 services in a wireless environment is much more difficult than in a traditional wired environment. Though it supports the Commission's efforts to make 911 services available to wireless system users, Ericsson asserts that the Commission should be sensitive to the difficulties inherent in deployment of wireless 911 services. In this regard, Ericsson, other manufacturers, service providers and trade associations have been working on issues relative to deployment of wireless 911 services. In many cases, industry-developed voluntary standards for provision of wireless 911 services will be the most effective way to implement such services at the earliest possible time.

## **II. 911 Availability**

With respect to wireless services to which any new rules will be applicable, the Commission proposes to require 911 compatibility only for real-time, two-way voice wireless services which are "service initialized", i.e., "...services which the user has purchased from a wireless service provider."<sup>4</sup> Ericsson agrees that this definition should be used to determine which wireless services should be subject to 911 compatibility

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<sup>4</sup> NPRM at para. 41, n.46.

requirements. In this regard, Ericsson asserts that the proposed definition properly distinguishes between “public” wireless services and “private” wireless services such as those provided by PMRS providers or equipment offerings provided pursuant to Part 15 of the Commissions rules, including wireless PBXs operated pursuant to Subpart D of Part 15 relating to unlicensed PCS devices.

The NPRM proposes to require mobile radio handsets to have the ability to make a 911 call without a requirement for user validation within one year after the effective date of the order adopting rules in the instant proceeding.<sup>5</sup> Ericsson believes the requirement is a reasonable one which can be implemented in the timeframe suggested.<sup>6</sup> However, Ericsson suggests the Commission should also require a standardized dialing pattern for 911 services accessed through a mobile handset. Specifically, the dialing pattern for access to 911 services should be “911” plus “send.” Though Ericsson recognizes this will require a mobile handset user to affirmatively press the “send” button, the extra time involved will ultimately eliminate confusion for numerous wireless service users.

At the present time there are in excess of 20,000,000 cellular mobile handsets in operation and millions of other real-time, two-way voice terminals which will be subject to any new rules adopted as a result of this proceeding. All of these terminals require the user to dial a telephone number (or speed dial number) and press the “send” button in order to initiate a call. Subscribers to wireless systems are familiar with this dialing

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<sup>5</sup> NPRM para. 41.

<sup>6</sup> Support for this requirement does not imply that wireless 911 calls must be completed in every instance. Many factors affect the ability of a wireless call to be completed, including but not limited to, signal strength, coverage, battery condition of a terminal, etc. Neither the service provider nor the manufacturer can, or should, guaranty that every wireless 911 call will be completed.

pattern. Therefore, the same dialing pattern should be required for accessing wireless 911 services. If the same dialing pattern is not mandated, those who wish to access 911 services from wireless terminals may encounter delays in accessing PSAP attendants.

### **III. 911 Call Priority**

The *NPRM* proposes to require originating 911 calls to be assigned priority over non-emergency wireless calls within one year after the effective date of the adoption of an order in this proceeding.<sup>7</sup> Ericsson suggests this proposal should be a goal to be achieved for wireless systems rather than a firm requirement. This is due to the different operational characteristics of existing real-time, two-way voice wireless services.

In today's cellular systems and tomorrow's PCS systems, call queuing is not utilized. Cellular and PCS systems do not differentiate between the types of calls received and/or transmitted. To the extent a channel is not available when a call is placed the user gets a "system" busy signal. In order to make call queuing available on today's cellular and tomorrow's PCS systems, significant modifications would have to be made to the air-interface standards presently being used.

From a technical standpoint, development of an air-interface standard to implement call queuing could take three years or more. After that, cellular service providers would have to upgrade their system infrastructures to take advantage of call queuing. This would be extremely time consuming and expensive for service providers and subscribers alike. It should also be noted that today's cellular systems have an excellent record of call

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<sup>7</sup> *NPRM*, para. 44.

completion.<sup>8</sup> As more cellular systems convert to digital technology call completion percentages will increase substantially. Thus, given the time and cost involved in implementing a new air interface standard which will be able to prioritize emergency calls versus the already high percentage of cellular calls completed, no mandatory queuing requirement is necessary.

Some real-time, two-way voice services, such as SMR systems, already provide call queuing. With respect to these systems it is conceivable that additional technical innovation can provide a means of placing 911 calls at the beginning of a queue for transmission. However, the work necessary to accomplish this task is not likely to be able to be completed within 1 year after the effective date of adoption of an order in this proceeding. Ericsson submits that a three year time frame is a more realistic assessment of the time necessary to accomplish this goal.

For the foregoing reasons, the Commission should refrain from imposing mandatory requirements for 911 “call priority” for those systems that do not currently include queuing as part of their operational characteristics. For those systems which do provide call queuing, 911 call priority should be a goal to be reached, albeit, within 3 years of the effective date of adoption of an order in this proceeding.

#### **IV. User Location Information**

The Commission proposes to require wireless systems to be able to provide PSAP attendants with automatic location identification (“ALI”). Due to the acknowledged difficulty of providing ALI in a wireless environment, the Commission proposes to

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<sup>8</sup> There is no reason to believe that call completion percentages for PCS systems will be lower than for cellular systems.

transition to mandatory ALI requirements over time in a three stage process. In Stage 1, “...wireless service providers would be required to design their systems so that the location of the base station or cell site receiving a 911 call from a mobile unit is relayed to the PSAP” and to “...permit connection of the mobile station to the PSAP closest to the mobile caller.”<sup>9</sup> This would have to be accomplished within 1 year after the effective date of Commission adoption of an order in this proceeding. In Stage 2, wireless systems would be required to provide additional ALI information to the PSAP which would include “...an estimate of the approximate location and the distance of the mobile unit from the receiving base station or cell site, calculated on the basis of the received signal strength or by some other method.”<sup>10</sup> This would have to be accomplished within 3 years after the effective date of adoption of an order in this proceeding. Lastly, within 5 years after the effective date of Commission adoption of an order in this proceeding, Stage 3 would “...require the mobile station [to] be located in a 3-dimensional environment within a radius of no more than 125 meters.”<sup>11</sup>

#### **A. Stage 1 Proposal**

Ericsson believes some Stage 1 requirements can generally be met within the time frame proposed by the Commission. For example, it is technically possible for wireless systems to be designed to provide the PSAP with information relative to the base station or cell sector to which the wireless handset is connected. This does not mean, however, that sufficient location information is transmitted to permit connection of the mobile to the

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<sup>9</sup> *NPRM*, para. 49.

<sup>10</sup> *NPRM*, para. 50.

<sup>11</sup> *NPRM*, para. 51.

PSAP closest to the mobile caller. Due to the varying characteristics of a “cell” in a wireless system, including power, antenna height and other technical criteria, the PSAP closest to the location of the base station/cell site may not be the PSAP closest to the subscriber in need of emergency assistance. Thus, Ericsson believes the Commission’s Stage 1 proposal should be modified to require sufficient information to be transmitted to identify only the location of the base station (or sector thereof) to which a mobile is connected.

#### **B. Stage 2 Proposal**

Ericsson acknowledges the need for wireless systems to provide more precise information to enable better location of wireless subscribers in need of emergency assistance. However, Ericsson believes the Commission’s Stage 2 proposal is too vague and does not provide the wireless community with sufficient information to enable it to determine if compliance with the new rules has been achieved. For example, in Stage 2 the Commission proposes that the base station or cell site be capable of providing the “approximate location” and distance of the mobile unit from the receiving base station or cell site. Without more specificity on how to define “approximate location” it will be impossible for any wireless system service provider or system manufacturer to know if and when compliance has been achieved.

Furthermore, in Stage 2 the Commission asserts that received signal strength or some other method be used to determine the approximate location and distance of the mobile unit from the receiving base station. Received signal strength is not an appropriate means for determining distance to the cell site, especially with respect to modern wireless

systems consisting of a number of overlapping cells. Signal strength constantly changes and is affected by many variables. For example, the signal strength may be very strong when the wireless handset is in a given location. A move from that location to one just a few feet away may significantly increase or decrease the relative signal strength. Similarly, in urban environments, signals bouncing off buildings may have a dramatic impact on the signal strength received by any particular mobile terminal.

Due to the difficulty in basing location information on signal strength as well as the general vagueness of the Stage 2 proposal, Ericsson submits the public interest would be better served by eliminating the proposed Stage 2 requirement.

### **C. Stage 3 Proposal**

In Stage 3, wireless systems would have to transmit sufficient information to enable a PSAP to locate a mobile station in a 3-dimensional environment within a radius of 125 meters. The requirement is intended to enable “relatively precise” location of a 911 caller in a wireless environment.

Though the Stage 3 proposal does not suffer from vagueness, the requirement to locate a wireless 911 caller within a radius of 125 meters, though technically conceivable in the future, will be very difficult to implement.<sup>12</sup> Technology will have to be refined to find a universal solution to the problem of location accuracy. Moreover, the tendency in the wireless environment has been towards smaller, less expensive mobile terminals which have long battery life and can be carried easily in a pocket, briefcase or purse. Aside from

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<sup>12</sup> Numerous radio technologies exist which can be used to determine the position of a mobile/portable terminal. However, all such technologies suffer from some disadvantage in actual implementation. For example, GPS and other satellite systems are not especially well-suited to in-building use due to penetration problems. Also, triangulation methods using terrestrial radio signals may be less than optimum in an urban environment due to reflections from tall buildings and similar structures.



the technical problems which will have to be overcome, the Stage 3 proposal will result in portable terminals which are bigger, heavier and have less battery life than existing wireless terminals. This will have a tendency to slow down the growth of wireless industries in general.

In addition, the 125 meter requirement of the Stage 3 proposal is not optimal in terms of providing very useful information to the emergency community. A 125 meter radius circle has an area of approximately 50,000 square meters or approximately 10 acres. It will be difficult to locate a mobile terminal in a rural or urban environment if one has to search an area of this magnitude. In an urban “three dimensional” environment the location problem is exacerbated since conducting a search of a 10 acre area in virtually any major metropolitan area which includes high rise buildings is not likely to assist in the “rapid” location of a mobile user in need of assistance. These problems must be balanced against the number of 911 calls in which the caller is unable to provide the PSAP attendant with information on his or her location or the number of 911 calls in which communications are cut-off before the caller can provide location information.

Ericsson submits the Stage 3 proposal is riddled with many technical and practical problems. This is not to suggest that the Commission and industry should abandon its efforts to adopt rules and/or procedures to make wireless 911 services comparable to wireline 911 services. It is to suggest that the Commission may want to focus on adoption of rules which place the intelligence for location of mobile terminals in the network component of a wireless system rather than in the wireless component. Accordingly, until such time as the wireless industry has decided on an appropriate technology (or

technologies) which can provide useful and dependable ALI information, the Commission should refrain from adopting Stage 3 rules as proposed in the *NPRM*.

## **V. Re-Ring/Call Back**

In the *NPRM* the Commission requests comment on the technical and economic feasibility "...of wireless services to provide the capability to return calls placed from mobile radio transmitters to a 911 emergency number immediately".<sup>13</sup> It further proposes that this capability be implemented within 3 years of the effective date of adoption of an order in this proceeding.

The technical capability to provide "re-ring/call back" within 3 years is feasible for some systems and is feasible within 5 years for other systems.<sup>14</sup> The problem industry will face on this issue relates to the ability of PSAPs to be able to effectively and meaningfully process all information transmitted by the wireless system. At the present time, virtually no PSAP is able to process all the information required to provide location or call back information. In moving forward with rules regarding wireless 911 services, the FCC should not require wireless service operators to provide more information than can actually be utilized by PSAPs. In the alternative, the FCC should require PSAPs to

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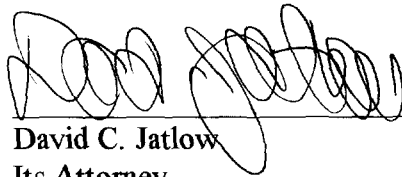
<sup>13</sup> *NPRM*, para. 52.

<sup>14</sup> Due to the technical differences between cellular/PCS and SMR systems, it may take up to 5 years for SMR systems to be able to comply with this requirement. Nonetheless, the ability of a PSAP to process and use all the information transmitted remains the same whether the wireless system is a cellular system, a PCS system or a SMR system.

upgrade their systems to ensure that the additional information provided by wireless service providers can be used in practice.

Respectfully submitted,

The Ericsson Corporation



David C. Jatlow  
Its Attorney

Young & Jatlow  
Suite 600  
2300 N Street, N.W.  
Washington, D.C. 20037  
(202) 663-9080

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